<u>REMARKS</u>

The Examiner is thanked for the thorough examination of the present application. In view of the arguments presented in detail below, it is submitted that all of the claims are patentable.

I. <u>The Claimed Invention</u>

The present invention is directed to a mobile ad hoc network (MANET). As recited in independent Claim 1, for example, the MANET includes a plurality of mobile nodes each including a wireless communications device and a controller connected thereto. The controller operates in accordance with a multi-layer protocol hierarchy. More particularly, at an upper protocol layer, the controller establishes a quality-of-service (QoS) threshold from among a plurality of different possible QoS thresholds based upon a type of given data to be transmitted to at least one destination node. At at least one intermediate protocol layer below the upper protocol layer, the controller selects at least one route for transmitting data to the at least one destination mobile node based upon the QoS threshold, and determines whether a QoS metric for the selected route falls below the QoS threshold. Furthermore, at a lower protocol layer below the at least one intermediate protocol layer, the controller cooperates with the wireless communications device to determine the QoS metric for the at least one selected route, transmit the given data to the at least one destination mobile node via the at least one selected route, and adjust signal

17

In re Patent Application of:
CAIN ET AL.
Serial No. **10/658,360**
Filing Date: **SEPTEMBER 9, 2003**
_____/

transmission power based upon a determination that the QoS metric
has fallen below the QoS threshold.

     Independent Claims 11 and 20 are directed to similar
MANETs, and independent Claims 28, 34, and 39 are directed to
related methods. Each of these claims also recites establishing a
QoS threshold at an upper protocol layer, as in Claim 1.

II. The Claims Are Patentable

     The Examiner rejected independent Claims 1, 11, 20, 28,
34 and 39 over U.S. Patent No. 6,629,151 to Bahl in view of U.S.
Patent No. 6,832,249 to Cisco et al. Bahl is directed to a
wireless LAN system in which network layer interfaces perform
static and dynamic queries, as well as requests to set
attributes. While the Examiner correctly acknowledges that Bahl
fails to teach or fairly suggest establishing a QoS threshold
from among a plurality of different possible QoS thresholds based
upon a type of given data to be transmitted to at least one
destination node at an application layer, he contends that Cisco
et al. provides this noted deficiency. Ciscon et al. is directed
to a method for providing broadband communications over a multi-
protocol layer wired network (i.e., the Internet). As support for
his contention, the Examiner points to col. 10 of this reference
which discusses a network monitor that monitors communication
resources of various network elements searching for QoS events.

     It is respectfully submitted that the selective
combination of references fails to teach or fairly suggest all of
the recitations of the above-noted independent claims. As an

initial matter, while the above-noted text of Ciscon et al. discusses that different types of QoS metrics may be used, and that the way in which "error seconds" are determined may be changed based upon the given implementation, nowhere does this or any other passage in Ciscon et al. teach or fairly suggest establishing one of a plurality of QoS thresholds based upon a given type of data to be transmitted, as recited in the above-noted independent claims.

Moreover, neither of the cited references has anything to do with MANETs or performing routing in complex MANET environments. Bahl is directed to querying dynamic aspects of wireless connections in a wireless LAN. An existing wireless LAN typically includes a fixed network with one or more access points connected thereto, and wireless clients or devices access the fixed network via the access points over wireless links. A wireless LAN may have a basic peer-to-peer or "ad hoc" mode, as generally noted at col. 16, lines 6-22 of Bahl. In this mode, wireless devices within range of each other discover and communicate in peer-to-peer fashion without involving central access points. Ciscon et al. is concerned with wired network communications and control operations and is therefore even farther removed from the MANET environment.

In contrast, a MANET is a network that is formed of mobile (and potentially stationary) nodes, and is created on the fly as the nodes communicate with each other. The network does not depend on a particular node and dynamically adjusts as some nodes join or others leave the network. As discussed in the

background of the present application (see, e.g., paragraphs 0002-0005 of the originally filed specification), because MANETs lack a fixed infrastructure, nodes must self-organize and reconfigure as they move, join or leave the network. All nodes are essentially the same, and there is no natural hierarchy or central controller in the network. All functions may be distributed among the nodes. Nodes are often powered by batteries and have limited communication and computation capabilities. Also, the bandwidth of the system is usually limited. The distance between two nodes often exceeds the radio transmission range, and a transmission may have to be relayed by other nodes before reaching its destination. Consequently, a MANET network typically has a multi-hop topology, and this topology changes as the nodes move around.

Moreover, there is simply no proper motivation or suggestion to combine the references as the Examiner proposes. More particularly, Ciscon et al. addresses QoS issues in a wired network context, in that it proposes methods for monitoring QoS events to allow a response to be formulated (e.g., by provisioning additional circuits) that will improve or maintain a desired level of QoS. Bahl simply formulates mechanisms by which a software system can interface with a wireless device for the purpose of extracting status or to set parameters.

Further, while the Ciscon patent proposes some methods for controlling QoS in a wired system, these methods cannot be easily adapted to wireless systems. Achieving desired QoS in a wireless environment involves the use of domain-specific wireless

20

knowledge to control the allocation of resources to balance QoS
and network capacity by controlling wireless-specific signal and
radio coverage characteristics. Yet, neither Bahl nor Cisco
provides guidance or direction as to how this could be
accomplished.

Moreover, QoS in a conventional wired network is
primarily concerned with the avoidance and management of traffic
congestion arising from the delay of packets due to buffering by
routers and switches, and transmission delays over cable and wire
links. QoS in a wireless network is more involved and requires
accounting for bit errors due to low signal-to-noise ratio, and
lost packets due to outages caused by attenuation, interference,
blockages, etc., which are typically not encountered in the wired
network context.

As such, since neither of the above-noted references
teaches or fairly suggest applying the principles thereof to a
MANET, or how to perform the claimed QoS operations in any
wireless network, one of ordinary skill in the art would not have
been motivated to combine the references as the Examiner
proposes. Since the remaining prior art of record fails to
provide the above-noted deficiencies, taking all of the teachings
of the prior art as a whole, the prior art simply fails to teach
or fairly suggest all of the recitations of independent Claims 1,
11, 20, 28, 34 and 39. Accordingly, it is submitted that these
claims are patentable over the prior art. Their respective
dependent claims, which recite yet further distinguishing
features, are also patentable over the prior art and require no

In re Patent Application of:
CAIN ET AL.
Serial No. **10/658,360**
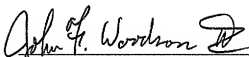Filing Date: **SEPTEMBER 9, 2003**
_____/

further discussion herein.

CONCLUSIONS

In view of the foregoing, it is submitted that all of
the claims are patentable. Accordingly, a Notice of Allowance is
respectfully requested in due course. Should any minor
informalities need to be addressed, the Examiner is encouraged to
contact the undersigned attorney at the telephone number listed
below.

Respectfully submitted,

JOHN F. WOODSON, II
Reg. No. 45,236
Allen, Dyer, Doppelt, Milbrath
    & Gilchrist, P.A.
255 S. Orange Avenue, Suite 1401
Post Office Box 3791
Orlando, Florida 32802
407-841-2330
407-841-2343 fax
Attorney for Applicants